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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,208	06/19/2001	Peter Charles Eastty	450110-4271.1	5224

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EXAMINER	
PENDLETON, BRIAN T	
ART UNIT	**PAPER NUMBER**
2644	11+12

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/884,208	EASTTY ET AL.	
	Examiner	Art Unit	
	Brian T. Pendleton	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 4-6 is withdrawn in view of the newly discovered reference(s) to Ahamed, US Patent 4,142,066. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 8, 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (APA) in view of Ahamed further in view of Cuzzo. In the Description of the Prior Art section, Applicant admits of storing one-bit digital audio signals with available equipment (AES/EBU digital audio recorder) by multiplexing groups of bits of the one-bit audio signal into data words, specifically 4 x 16-bit words, for recording on two stereo channels, which reads on "a storage and/or transmission medium for storing and/or transmitting" one-bit digital audio signals. The APA also discloses that a lost signal in a delta-sigma modulated system would result in a maximum noise level which one of ordinary skill in the art would have realized presented a damage risk to an amplifier and loudspeaker. Thus, one of ordinary skill in the art would have been motivated to eliminate that risk. APA does not disclose "an input inverter for inverting alternate data bits of an input one-bit digital signal, to generate a bit-inverted signal", "an output inverter for inverting alternate data bits of said bit-inverted

signal, to regenerate said input one-bit digital signal", and "wherein to invert said alternate data bits of said input one-bit digital signal, said one-bit signal is split into two bit streams respectively formed of alternate data bits of said input one-bit digital signal, and one of said two bit streams is inverted by said input inverter." Ahamed taught an apparatus for encoding speech using delta-sigma modulation techniques whereby when it was determined that a data word contained silence, a perfect preselected silence sequence of alternating "1"s and "0"s was substituted for the data word. The effect of the Ahamed apparatus and method was to eliminate a maximum noise level. One of ordinary skill in the art would have realized, without undue experimentation, that to achieve a sequence of alternating "1"s and "0"s in the midst of a stream of "0"s (a large magnitude signal), the alternate bits of the stream would have to be changed to "1"s. Cuzzo discloses in figure 2, element 67 and column 4 lines 39-45, an inverter which changes a digital "1" to "0" and vice versa. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to use an inverter, per the teachings of Cuzzo and Ahamed, to "invert alternate data bits of an one-bit digital signal, to generate a bit-inverted signal" for the purpose of preventing a large magnitude one-bit digital audio signal from being reproduced by a speaker. It was well known that a transmission loss of digital audio data could occur at any time during transmission and therefore it would have been obvious to generate a bit-inverted transmitted signal which would have to be inverted on the receiving end to recover the original signal but would output silence in the event of a consecutive stream of "0"s. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have an "input inverter for inverting alternate data bits" and "an output inverter for inverting alternate data bits of said bit-inverted signal, to regenerate said input one-bit digital signal". The APA

modified by Cuzzo and Ahamed would include "one-bit signal split into two bit streams respectively formed of alternate data bits of said input one-bit digital signal, and one of said two bit streams is inverted by said input inverter" since the APA taught multiplexing data into separate data streams. Claims 1 and 8 are met. As to claims 2 and 3, the APA discloses data words of 16 bits for an AES/EBU digital audio recorder. Regarding claim 4, the APA teaches multiplexing data bits of an input one-bit signal into data words with 16 bits and Ahamed and Cuzzo teach inverting a subset of data words, specifically alternate data bits are inverted. As to claim 5, it was obvious to generate two bit streams formed of alternate data bits, per the APA and forming data words for each bit stream comprising groups of successive bits of that bit stream is an obvious design choice. Per claim 6, it was obvious to have an output inverter and a demultiplexer on the receiving end to complement an input inverter and multiplexer on the transmission end. Per claim 11, APA teaches that in the event of a reproduction problem, the storage medium outputs a mute signal. As to claims 12 and 13, the combination meets the limitations. Per claim 14, APA discloses a one-bit digital audio signal.

4. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Ahamed further in view of Cuzzo as applied to claims 1 above, and further in view of Redfern & Co., GB 1 329 883. The combination of the admitted prior art, Ahamed and Cuzzo do not disclose means for providing an inversion control signal having a signal state varying between two predetermined states and logic to selectively invert data bits of the input one-bit digital signal in response to the inversion control signal. However, Ahamed suggested in column 3 lines 7-25, that several bit sequences can be used to generate a digital silence signal which would motivate one of ordinary skill in the art to provide a system for inverting certain bits while

not inverting certain bits. Redfern & Co. disclosed a pseudo-random sequence that can be generated with a feedback shift register. Such a sequence provides an inversion control signal and control logic, per claim 9, and comprises a shift register having a one-bit output fed back to the input of the shift register and an exclusive OR gate operable to combine a current bit output by said shift register with a current bit of the input one-bit digital signal. It would have been obvious to one of ordinary skill in the art at the time of invention to use the circuitry of Redfern & Co. for the purpose of generating a random bit sequence for silence.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (703) 305-9509. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

btp

MINSUN OH HARVEY
PRIMARY EXAMINER